Greener medical homes

Environmental responsibility in family medicine

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The world is expecting more from you than half-measures.
United Nations Secretary-General Ban Ki-moon[1]

Well before the 2015 United Nations Conference on Climate Change in Paris, France, concerns about resource use in medical environments were discussed and documented in the local and global medical literature.[2,3] Dr Margaret Chan, Director-General of the World Health Organization, challenged the world to consider that conference on climate change

> the most important health agreement of the century: an opportunity not only to reduce climate change and its consequences, but to promote actions that can yield large and immediate health benefits, and reduce costs to health systems and communities.[4,5]

Concerned physician leaders penned an open letter to our Prime Minister in late 2015, echoing the World Health Organization's perspective on climate change as "the greatest threat to global health in the 21st century," urging the government to take action.[4-6] The Lancet Commission on Health and Climate Change asserted that tackling climate change "could be the greatest global health opportunity of the 21st century."[7] With building recognition of the urgency to act, will family physicians commit to being part of the solution?

Why should this matter to us?

As an influential group involved in both health consumption and health education, we have health, environmental, and business reasons for "greening" our clinics; but we also have a growing and most compelling rationale for pursuing environmentally friendly practices: a multigenerational responsibility and ethical imperative to deliver health care with solid efforts to mitigate the environmental impact.[3]

Ecological footprint is a concept that provides a "method for assessing the overall impact of an activity, facility, community or nation in terms of the amount of land required to produce the resources that are consumed or absorb the wastes that are produced."[3] Dr Susan Germaine assessed the ecological footprint of Lions Gate Hospital in North Vancouver, BC; she found that the hospital had an ecological footprint of about 2841 hectares, which is 739 times its actual size.[2,3] If health facilities and clinics were to calculate their ecological effect or footprint, would the results be as staggering as those found by Germaine? In 2000 Ontario's Ministry of the Environment estimated that Ontario hospitals produced 150 000 tonnes of solid waste annually.[3] We are repeatedly advised that the effect of human activities on the globe is being and will be felt most directly by the world's most vulnerable populations, and as providers of health care, this might be the most motivational knowledge we have.[8]

There was support for green health care at a 2006 workshop held by the Institute of Medicine Roundtable on Environmental Health Sciences, Research, and Medicine:

> Thus a hospital with a successful triple bottom line would boast positive impacts on the health and well-being of its patients, staff, and visitors; efficient use of energy and natural resources, with minimal waste and pollution generated; and healthy financial performance. Many private firms recognize that this approach not only advances their goals but also positions them well on the market, enhancing their image and earning customer loyalty. These rationales apply directly to green health care.[9]

Financial benefits, waste reduction, and resource conservation are benefits of a resource-reduced approach to clinic management. Being better global and local citizens is considered another benefit in a milieu of increasing concern about climate change and its relationship to consumption and health effects. In **Table 1**[10] we offer a checklist that can assist in starting a green family medicine clinic.

Where do we go from here?

As leaders in family medicine, we must ensure that family medicine educational settings commit to the environment in their everyday work, ensuring family physicians of the future learn ways to make the environment part of quality improvement routines and an ethical foundation of their academic and clinical practice. Such a movement would be consistent with commitments to

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Table 1. Primer and checklist for greener family medicine clinics

FACTOR	ACTIONS
Green values	• Make a commitment -Where are the ideal places to start? (Pick low-hanging fruit) -What values can you identify that will assist you as you proceed? -What research or measurement techniques might be useful? Consider involving residents • Consider curriculum concepts for teaching practices (eg, a quality assurance project for residents). Exemplify an environmentally friendly clinic for students and residents • Join with allies (eg, public health, community, municipalities)
Waste management	• Reduce -Reuse paper printed on 1 side, provided confidential information is not released -Set your printer to double-sided printing. Do audits to ensure that staff and the IT department reset any forms that result in wasted paper -Ensure there is no wasted content on frequently printed documents -Do a mail audit (What journals or other publications are redundant or can be received by e-mail rather than paper?) -Refuse unnecessary packaging from pharmaceutical companies -Find a solution to paper coffee and tea cups in your setting -Contact the Canadian Direct Marketing Association (416 391-2362) to request junk mail be stopped • Reuse -Use nonglutaraldehyde sterilizers or steam autoclaves -Use cloth gowns -Stock reusable rather than disposable equipment such as specula • Recycle -Recycle paper, glass, plastic, and aluminum; keep recycling bins in areas where these materials are used -Use green-bin (organics) system, if available; this will require staff cooperation and support -Ensure your recycling system is working (What percentage of your recycling actually ends up recycled?)
Energy management	• Choose energy-efficient equipment • Turn down the thermostat at night and on weekends • Set your air conditioner 2 degrees higher and your furnace 2 degrees lower • Use energy-efficient lighting • Turn off computers and other electronic equipment when not in use; set computers to sleep mode at end of day • Ensure that windows and exterior doors are sealed • Use motion sensors or timed lighting for unoccupied rooms; encourage "lights-off" behaviour in common spaces • Use natural light as much as possible • Consider a tankless hot water heater on a timer
Buildings and green space	• Consider less-toxic materials such as cork, hardwood, or linoleum rather than carpet • Use paint that is low in volatile organic compounds • Consider furniture that does not emit formaldehyde (natural wood or environmentally constructed options) • Choose pest management options that are safe for patients, staff, and the environment • Choose plants that are drought resistant and do not rely on herbicides or watering to thrive • Consider a rooftop garden—might be an option for cooling
Toxin management	• Ensure safe management of patient drugs and encourage same behaviour from patients. Remind patients of "not down the drain"; be willing to accept unwanted pills; and have a program for safe disposal of drugs • Replace mercury thermometers and sphygmomanometers with nonmercury alternatives; dispose of mercury products safely • Use effective nontoxic cleaning solutions
Water management	• Fix leaks • Install restrictors (aerators) on taps • Reduce or refuse the use of bottled water; consider a department policy against bottled water at events • Consider reducing water coolers and install filters on tap water

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FACTOR	ACTIONS
Transportation (public transit, car pool, bike and car sharing, parking, etc)	• Find ways to communicate options other than single-driver vehicle options • Assist staff and learners with car-pooling options • Ensure there is a safe place for bike storage • Ensure safety is addressed for all means of transit • Encourage teleconferences and videoconferences where feasible • Ensure staff have change rooms and showers
Responsible community members	• Be mindful of space sharing, noise pollution (eg, HVAC systems), light pollution, and organization of meetings (reduce traffic by using technology; consider peak traffic and meeting times)
Purchasing and procurement (includes green cleaning)	• Purchase environmentally friendly paper with high post-consumer content and chlorine-free bleach; environmentally friendly medical equipment • Use certified environmental products such as those approved by EcoLogo, Green Seal, and Forest Stewardship Council
Partnerships and other green initiatives	• Develop partnerships with municipal programs that focus on environmental initiatives; local and university transit systems (eg, create passes incentives); car-sharing and bike-sharing programs • Involve patients

HVAC—heating, ventilation, and air conditioning, IT—information technology.
Data from Council of Ontario Universities.[10]

environmental sustainability in higher education already made by many universities in Canada such as the Sustainability Tracking, Assessment and Rating System of the Association for the Advancement of Sustainability in Higher Education, the Talloires Declaration, and the University and College Presidents' Climate Change Statement of Action for Canada.

Some hospitals have already started along this path. The Cleveland Clinic in Ohio was the first US health care provider to commit to the United Nations Global Compact initiative, which included human rights, labour, and environmental and anticorruption standards.[11] Hospitals, with their considerable ecological footprints, are increasingly using environmental measures as quality indicators.[9,12] Government funding has encouraged this activity and subsequent publishing of the outcomes of green initiatives. Hospital sector initiatives include the Green Hospital Scorecard Initiative and the Green Hospital Champion Fund Implementation Program of the Ontario Hospital Association, as well as the adoption of the ISO 14001 environmental management system standards (Hospital for Sick Children in Toronto, Ont, and Lions Gate Hospital among others). The UK National Health Service is another example of a comprehensive system-wide program. Many non–health care organizations are making similar progress using frameworks such as Triple Bottom Line,[13] Leadership in Energy and Environmental Design,[14] B Corp Best for the World,[15] and the Global Reporting Initiative.[16]

Have we kept pace in our family practices?

It is apparent that businesses, universities, and hospitals have been making progress in environmental sustainability and social responsibility while continuing to focus on financial efficiency and care provision. However, there is little outcomes-based literature available detailing implemented environmental sustainability measures in our family medicine clinics and academic settings. The *Quality Book of Tools,* a peer-reviewed family practice quality improvement tool by Levitt and Hilts, has extensive quality indicators but lacks a specific section on environmental considerations because its family physician–participant-driven Delphi method did not validate the "commitment to an eco-efficient or green office" as a quality improvement criterion.[17,18] The Lean system, a familiar quality improvement tool used in health care settings, and the College of Family Physicians of Canada's Patient's Medical Home practice and education document address practice efficiency but do not indicate resource rationing or environmental concern as a collective value in either the training of residents or the care of patients.[19,20] Some family medicine teaching settings in Canada have taken steps to incorporate environmentally sound and greener approaches in their practices. Such sites include McMaster University's Stonechurch and David Braley family health centres in Hamilton, Ont, and the Centre for Family Medicine in Kitchener-Waterloo, Ont.[21-23] Additionally there are many articles detailing practical approaches to reducing use of resources in medical outpatient settings. However, we were unable to find published evidence of the adoption of this ethos in family medicine educational settings along with implementation outcomes.

Next steps to lighter footprints

Residents are looking for quality assurance projects that will make a difference when they have completed their programs. We suggest they consider how they might contribute to local and global environmental health during their quality assurance or research time. In fact, funding exists from the Ontario College of Family Physicians' Environmental Health Committee to

encourage this type of research, and similar opportunities likely exist elsewhere. Residents and students can be our greatest asset in making responsible decisions about the use of resources and, vitally, disseminating new experience and knowledge. The application of new environment-inclined practice changes will need outcomes to be monitored and shared to build an evidence-informed body of literature to support and guide change.

Family medicine clinics and teaching clinics' waste generation and energy and resource use are all compelling reasons to understand our ecological footprints and employ direct and immediate action to mitigate our collective contribution to climate change. The potential now and in the future is considerable; it is urgent that we join the world and reduce the effects of health care on our environment and the very people for whom we provide care.

Getting started

Whether using the *Quality Book of Tools*,[17,18] the Lean system,[19] or some other means to address continuous quality improvement, consider environmental practices as a stated value.

With the recognition of responsibility for consumption and its effect locally and globally, clinicians and administrators can identify a leader and put together a team. Bring together all team members appropriate in your setting. Consider including learners and family practice patients who will have either expertise or interest in this area. The suggestions in **Table 1**[10] can help you get started. Approaches to greener health care must also be an iterative process that includes publishing findings with the goal of identifying best practices in management of resources in family medicine outpatient health care provision and medical education.

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References

1. Ki-moon B. *High-level segment*. Presented at: United Nations Conference on Climate Change, 2015; 2015 Nov 30-Dec 12; Paris, Fr.
2. Sibbald B. Hospitals leaving huge "ecological footprints": report. *CMAJ* 2002;166(3):363.
3. Hancock T. *Doing less harm: assessing and reducing the environmental and health impact of Canada's health care system*. Branchton, ON: Canadian Coalition for Green Health Care; 2001. Available from: **www.sc.edu/sustainableu/TrevorHancockInfo.pdf**. Accessed 2016 Apr 6.
4. World Health Organization [website]. *WHO calls for urgent action to protect health from climate change—sign the call*. Geneva, Switz: World Health Organization; 2016. Available from: **www.who.int/globalchange/global-campaign/cop21/en/**. Accessed 2016 Apr 6.
5. Howard C, Lau K, Orbinski J, Lavoie C, Vakil C, Meili R, et al. Open letter from Canadian physicians to Justin Trudeau. *National Observer* 2015 Nov 30. Available from: **www.nationalobserver.com/2015/11/30/news/open-letter-canadian-physicians-justin-trudeau.** Accessed 2016 Apr 6.
6. World Health Organization [website]. *Climate change and human health*. Geneva, Switz: World Health Organization; 2016. Available from: **www.who.int/globalchange/en/.** Accessed 2016 Apr 6.
7. Watts N, Adger WN, Agnolucci P, Blackstock J, Byass P, Cai W, et al. Health and climate change: policy responses to protect public health. *Lancet* 2015;386(10006):1861-914.
8. World Health Organization. *Environment and health risks: a review of the influence and effects of social inequalities*. Copenhagen, Den: World Health Organization; 2010. Available from: **www.euro.who.int/__data/assets/pdf_file/0003/78069/E93670.pdf**. Accessed 2016 Apr 6.
9. Institute of Medicine. *Green healthcare institutions: health, environment, and economics. Workshop summary*. Washington, DC: National Academies Press; 2007.
10. Council of Ontario Universities. *Ontario universities: going greener. Report of campus sustainability initiatives*. Toronto, ON: Council of Ontario Universities; 2009.
11. Cleveland Clinic. *Serving our present, caring for our future. Progress in community and global citizenship 2013*. Cleveland, OH: Cleveland Clinic; 2013. Available from: **http://my.clevelandclinic.org/ccf/media/files/About-Cleveland-Clinic/overview/CC_UNreport_2013.pdf.** Accessed 2016 Apr 6.
12. Greening Canadian Hospitals. *Community Research Connections. Discussion paper series. Number 7*. Victoria, BC: Community Research Connections; 2010.
13. Elkington J. Partnerships from cannibals with forks: the triple bottom line of 21st-century business. *Environ Qual Manage* 1998;8(1):37-51
14. Canada Green Building Council [website]. *Going green with LEED*. Ottawa, ON: Canada Green Building Council. Available from: **www.cagbc.org/CAGBC/LEED/GoingGreenLEED/CAGBC/Programs/LEED/Going_green_with_LEE.aspx?hkey=01b3d086-d0a4-42cf-9e61-7830d801c019.** Accessed 2016 Apr 7.
15. Certified B Corporation [website]. *B lab Canada*. Wayne, PA: Certified B Corporation; 2015. Available from: **www.bcorporation.net/Canada.** Accessed 2016 Apr 7.
16. *Global Reporting Initiative* [website]. Amsterdam, Neth. Available from: **www.globalreporting.org/Pages/default.aspx**. Accessed 2016 Apr 7.
17. Levitt C, Hilts L. *Quality book of tools*. Hamilton, ON: McMaster Innovation Press; 2010.
18. Levitt CA, Nair K, Dolovich L, Price D, Hilts L. Refinement of indicators and criteria in a quality tool for assessing quality in primary care in Canada: a Delphi panel study. *Fam Pract* 2014;31(5):607-21.
19. Toussaint JS, Berry LL. The promise of Lean in health care. *Mayo Clin Proc* 2013;88(1):74-82.
20. College of Family Physicians of Canada. *A vision for Canada. Family practice. The patient's medical home*. Mississauga, ON: College of Family Physicians of Canada; 2011. Available from: **http://patientsmedicalhome.ca/files/uploads/PMH_A_Vision_for_Canada.pdf**. Accessed 2016 Apr 6.
21. Stonechurch Family Health Centre [website]. *Mission*. Hamilton, ON: McMaster University; 2016. Available from: **http://stonechurchclinic.ca/clinic-info/mission.** Accessed 2016 Apr 14.
22. McMaster Family Practice [website]. *About us*. Hamilton, ON: McMaster University; 2016. Available from: **http://mcmasterfamilypractice.ca/about-us**. Accessed 2016 Apr 14.
23. Centre for Family Medicine [website]. *About*. Kitchener, ON: Centre for Family Medicine. Available from: **http://family-medicine.ca/about/mission-and-vision/**. Accessed 2016 Apr 7.